



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D212-664-201
Job Sheet 170233



Part No: D212-664-201

Job Qty: 1 ea

Part Name: Aft Crosstube - High



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 1/12/18

Job Tracking No:

Due Date: 1/19/18

Created By: Marie Lajeunesse

Type: Stock

Description:

Note: DWG DSI9563 REV B, D212-664-241 REV E IPP Rev:E 04.02.16 Reformat K/DS IPP Rev:F 06-03-29
Remove Coments on Pick List JLM IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H 08-05-22 up date Qty of
rubber cushion DD verf:EC IPP REV:I 14.05.27 AS PER ECN14-570 DD VERF:JLM

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea	1/18/18	1/18/18	0.00	0.00	Start Up Crosstubes-1		GP
110	Packaging	1 pcs	1/18/18	1/18/18	0.00	0.00	Packaging1-3		GP
120	CNC Bend Crosstubes	1 pcs	1/18/18	1/18/18	0.00	4.44	CNC Bend Crosstube		GP/DP
130	QC	1 pcs	1/18/18	1/18/18	0.00	0.00	QC15		38
140	Crosstubes	1 pcs	1/18/18	1/18/18	0.00	4.99	Crosstubes-1		DP2
150	HandFXtube	1 pcs	1/18/18	1/18/18	0.00	1.25	HandFinish5		DAS
160	QC	1 pcs	1/18/18	1/18/18	0.00	0.00	QC7-1		38 DAS
170	QC	1 pcs	1/18/18	1/18/18	0.00	0.00	QC5		38
180	Outsource	1 pcs	1/18/18	1/18/18	0.00	0.00	Outsource2	38964	12/18/18 38
190	Packaging	1 pcs	1/18/18	1/18/18	0.00	0.00	Packaging2		ATU/10/18
200	QC	1 pcs	1/18/18	1/18/18	0.00	0.00	QC5		38
210	SprayPaint	1 pcs	1/18/18	1/18/18	0.00	1.47	Spray Paint		18/02/18
220	QC	1 pcs	1/18/18	1/18/18	0.00	0.00	QC14		11 FEB 09 2018
230	Crosstubes	1 pcs	1/19/18	1/19/18	0.00	1.47	Crosstube		18 MAR 19 2018
240	QC	1 pcs	1/19/18	1/19/18	0.00	0.00	QC5		38
250	Packaging	1 pcs	1/19/18	1/19/18	0.00	0.00	Packaging1-3		DAS 38
260	QC	1 pcs	1/19/18	1/19/18	0.00	0.00	QC4		8 MAR 22 2018
265	DC	1 pcs	1/19/18	1/19/18	0.00	0.00	DC		38
270	Packaging	1 pcs	1/19/18	1/19/18	0.00	0.00	Packaging3-1		Smf
280	QC21-FG	1 Ea	1/19/18	1/19/18	0.00	0.00	QC21		21 MAR 29 2018

Part Op 120 - ***VERF SET-UP BEFORE BENDING BY: _____ *** Bend tube as per Dwg D212-664-241 using
Descriptions: CNC bender program 212-aft

140 - 1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010. 2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241 4- ***WEAR LATEX GLOVES HANDLIND CROSSTUBE.*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

150 - ***IMMEDIATELY AFTER GRINDING***

180 - ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____

190 - ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***

200 - ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Inspect for damage & ensure results are as per Dwg D212-664-241

210 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** white paint 138741 Clear P.O. 38683

220 - Then, Wrap in plastic bag to protect from scratches

primer 138687

DART
AEROSPACE

S037549

Aft Crosstube - High

PART NO:
Original Serial #: D212-664-201
Revision:
Operation:
Change No:

Start up Operation
CHG006

Job No: 170233
01/31/18

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

230 - *****LAY DOWN CORSTUBE ON TABLE AND PUT DT10302 PINS IN SADDLE HOLE FACING UP, USE HOLE IN TAPE MESURE TO PUT IN PINS FOR LOCATING CENTER OF CROSSTUBE. ***** 1- Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg 2- Install supports with Proseal 890 per D212-664-241 and QSI 015 A/R Proseal 890 Batch: 138784 EXP: 9/18
 PROSEAL CURE TIME 72 HOURS: Start: 18-3-12 Finish: 18-3-15 3- Install clamps with rubber cushion (ENSURE CLAMPS ARE INSTALL ON TOP SIDE OF CROSSTUBE) using DT9565 as per Dwg D212-664-241. ***Torque all clamps to 80-100 IN-LBS.***
 240 - ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***
 260 - ***VERIFY BY _____ BATCH # TO MATCH W/O _____
 265 - Photocopy bluefile and create labels as per PPP D212-664-201 CHG006
 270 - Identify and pack for shipping as per PPP D212-664-201 Location : FG098

Job Allocations

Operation	Component Part	Required	Inventory	Allocated	Std Qty
90-Start up Operation <u>163062</u>	D212-664-201TRN	1	8	0	0
250-Packaging	AN6-40A	4	112	0	0
	AN6-41A	2	46	0	0
	D3428-1	1	15	0	0
	MS21042L6	6	354	0	0
	NAS1149D0663J	18	1,371	0	0

Part Specifications

Specifications could not be found.

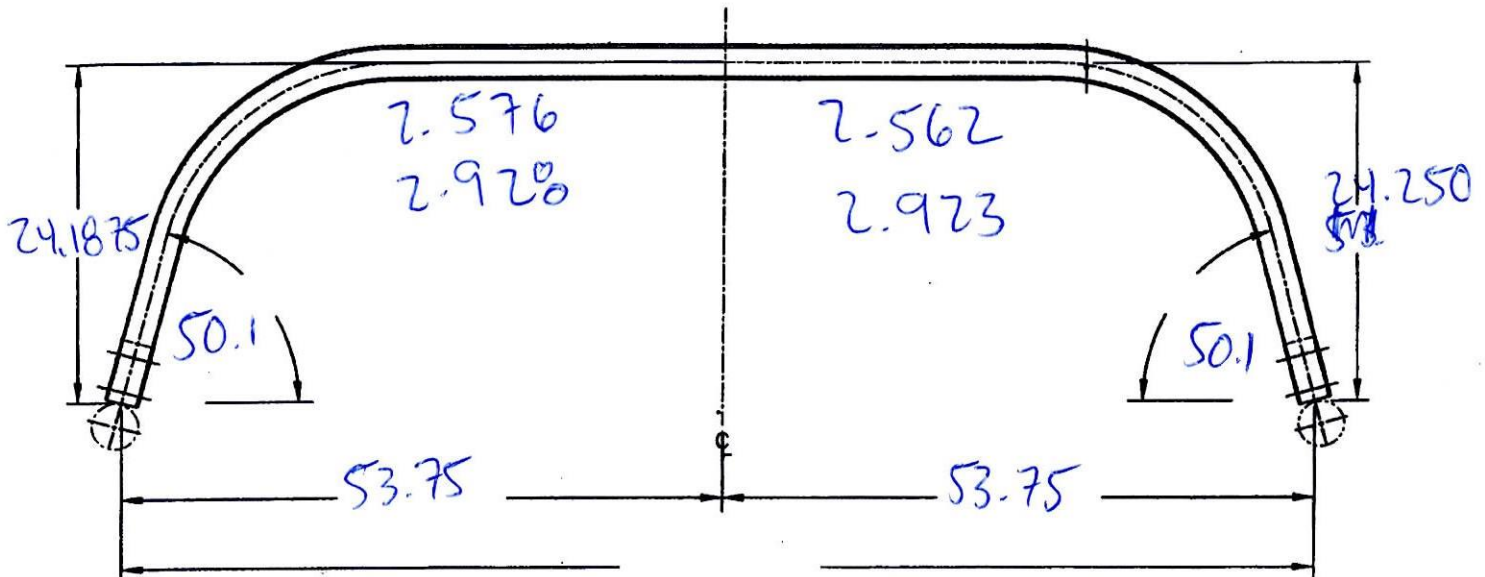
D2940-1 5005043(1) 5045463(1) Flex 1/12/18 7:53 AM Dart.lajeunesse.marie

MS21920-28 5024479

D3595-063-530 5052857(4)

DART AEROSPACE LTD	Work Order: 170233
Description: Crosstube High Aft (205/212)	Part Number: D212-664-201
Inspection Dwg: D212-664-241 Rev: E	Page 1 of 1

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70
Bending Passes	5	--
Crushing	--	7.2%



	Side A	Side B
Bending Passes	17	17
Crushing	6.4%	6.6%
Comments		

QC15 Inspection	
Date	FEB 01 2018

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	
E	14.07.08	Crushing percentage revised	KJ	

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2		D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6		2	D5018-1	SUPPORT
7	4	4	MS21920-28	CLAMP (OR MS21920-30)
8	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)
d) PAINT OUTSIDE PER DART QSI 005 4.2
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241/-241B = 44.2 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

ASSEMBLY

- INSTALL D2940-1 / D5018-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 170235 MWS
1801-12

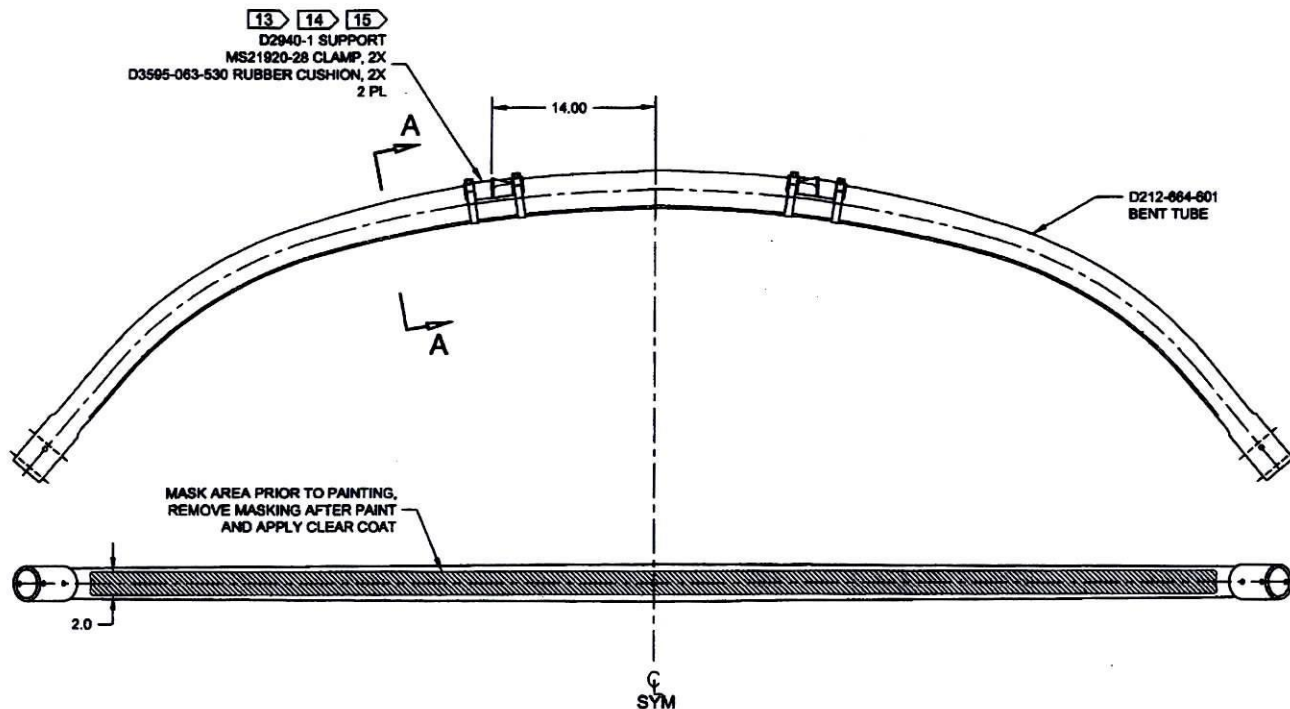
RELEASED
2014-05-26

E	D5018-1 WAS D2940-1 (-241B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (ZN B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-4), INCORP DEO D-1/-2	CP	14.04.01
D	REFORMAT/REVISE GENERAL NOTES/PART LIST: REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 06-048 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -100G ABRASION STRIP; ADD MAGNOBOND 6388, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	CP	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. REV. E
D212-664-241 SHEET 1 OF 5
TITLE SCALE
CROSSTUBE ASS'Y (205/212 HI AFT) NTS

COPYRIGHT © 2009 BY DART AEROSPACE LTD
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD

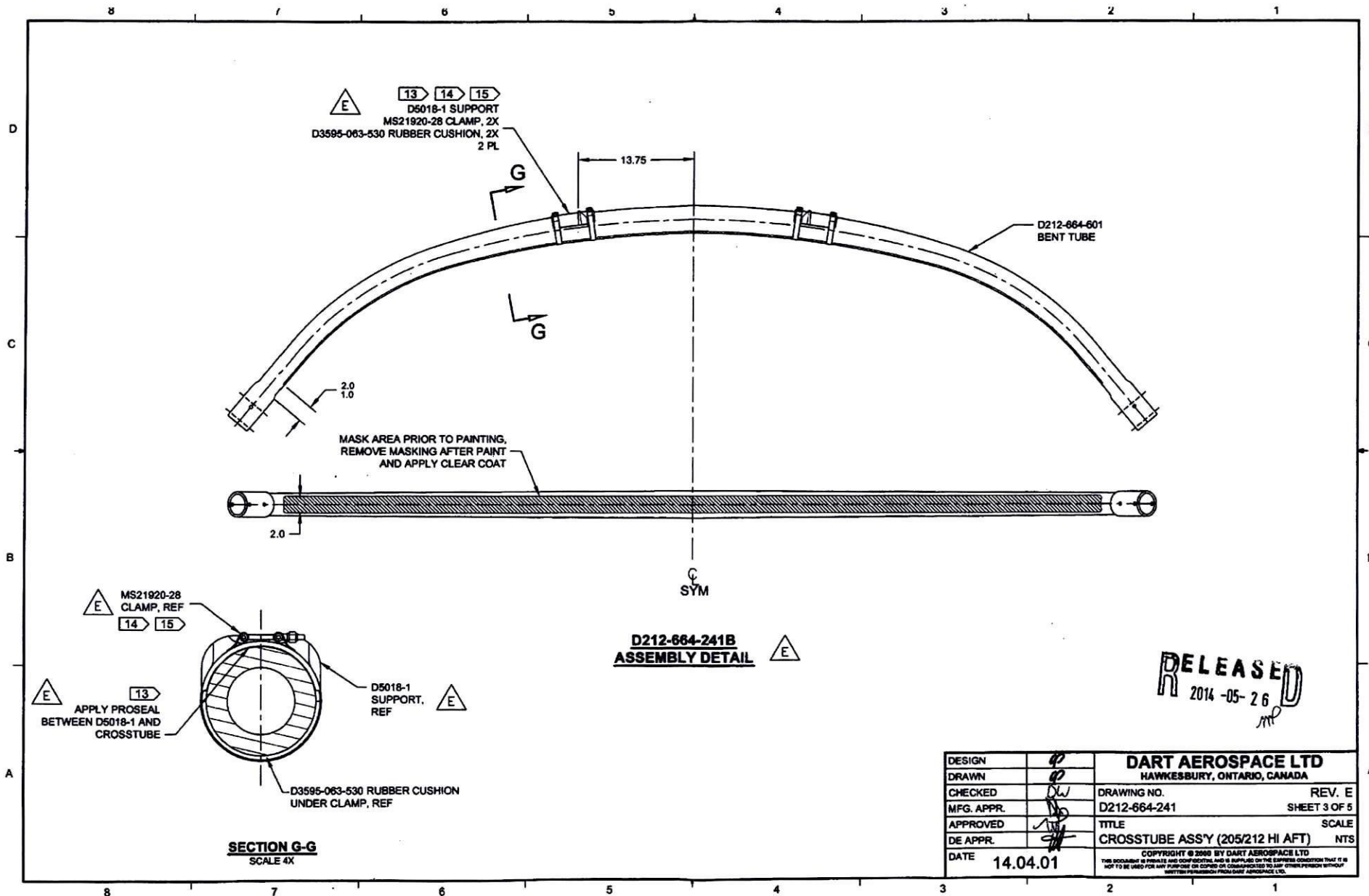


**D212-664-241
ASSEMBLY DETAIL**

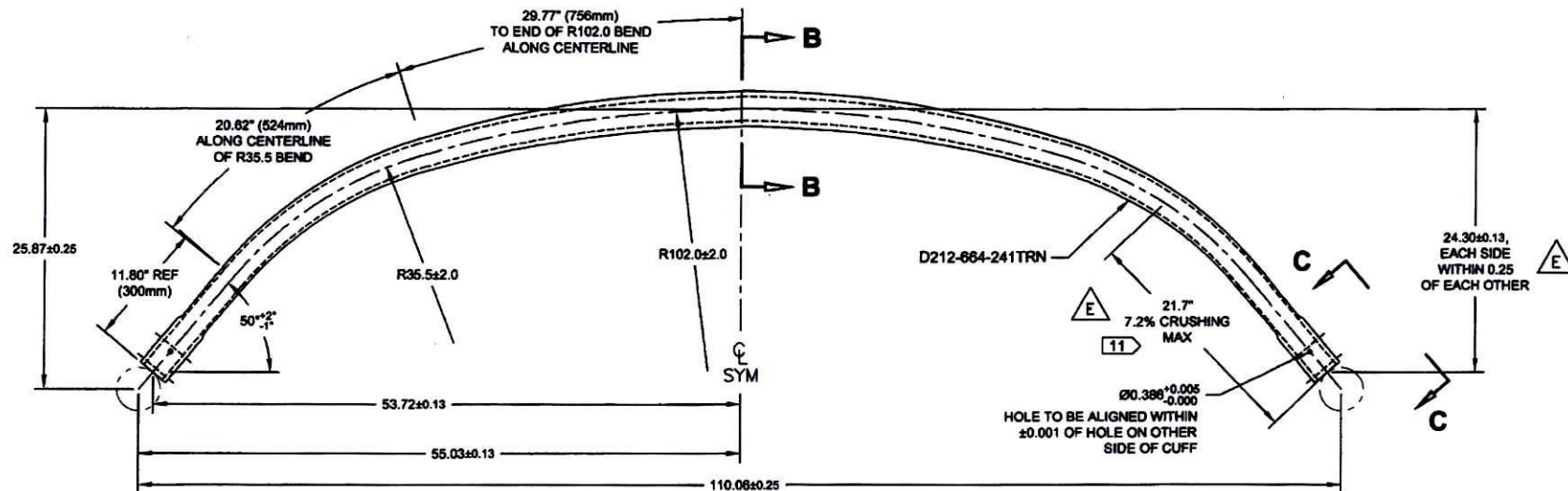
RELEASED
2014-05-26

**SECTION A-A
SCALE 4X**

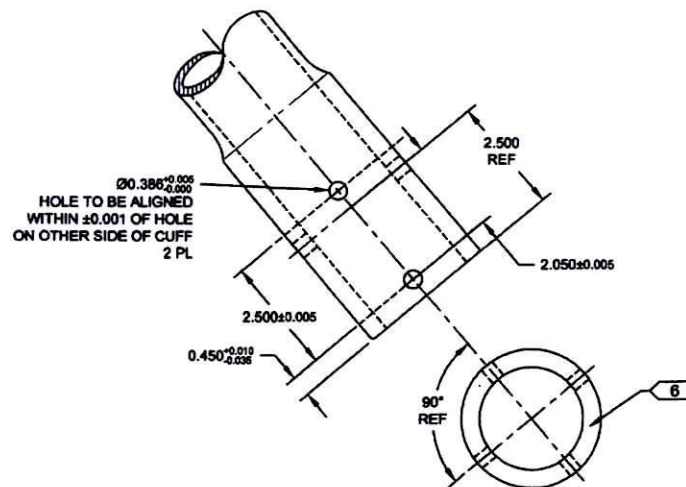
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-241	SHEET 2 OF 5
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2008 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND CONFIDENTIAL. AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY MANNER WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.	



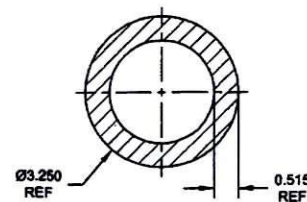
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-241	SHEET 3 OF 5
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



D212-664-601 11
BENDING AND DRILLING DETAIL



VIEW C-C: CUFF DETAIL
 SCALE 3X



SECTION B-B
 SCALE 4X

RELEASED
 2014-05-26
MD

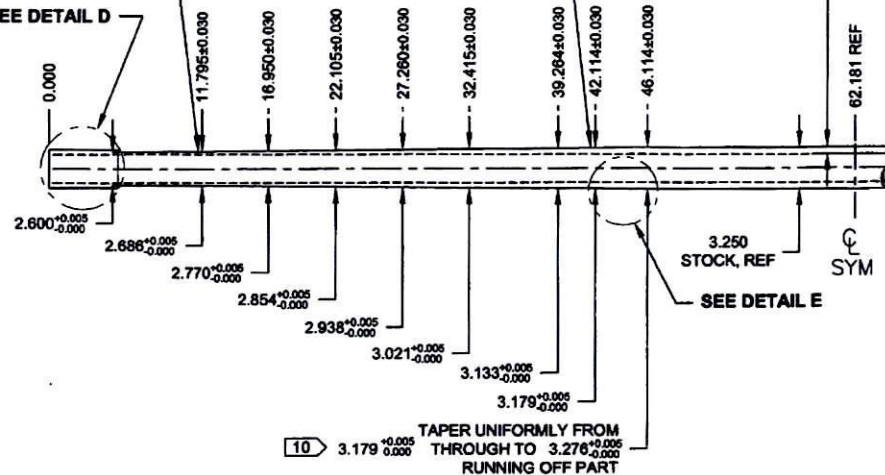
DESIGN		DART AEROSPACE LTD	
DRAWN	<i>DL</i>	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>DL</i>	DRAWING NO.	REV. E
MFG. APPR.	<i>DL</i>	D212-664-241	SHEET 4 OF 5
APPROVED	<i>DL</i>	TITLE	SCALE
DE APPR.	<i>DL</i>	CROSSTUBE ASSY (205/212 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PROPRIETARY AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

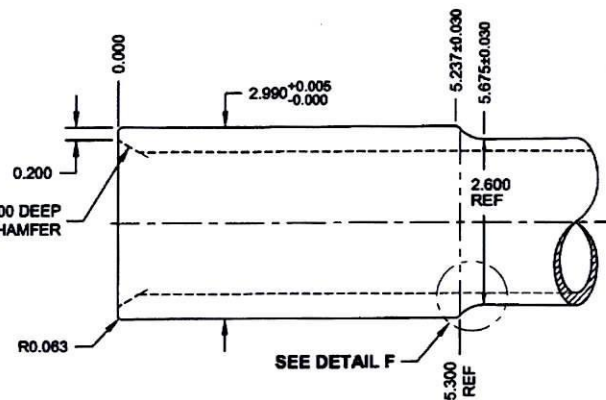
R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

0.615 WALL
STOCK, REF

SEE DETAIL D

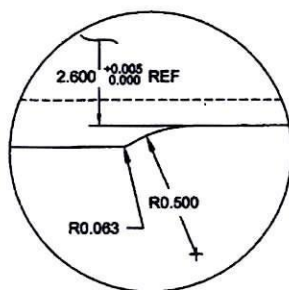


10
30° X 0.500 DEEP
CHAMFER

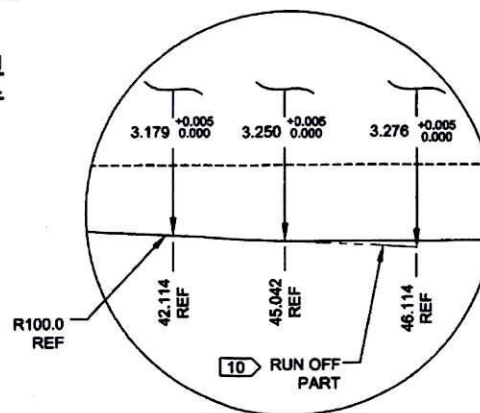


**DETAIL D:
CROSSTUBE CUFF**
SCALE 5X

**D212-664-241TRN
TURNING DETAIL**



**DETAIL F:
CUFF TRANSITION**
SCALE 10X



**DETAIL E:
TAPER RUN-OFF**
NOT TO SCALE

RELEASED
2014-05-26

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. E
MFG. APPR.		D212-664-241	SHEET 5 OF 5
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PREPARED AND CONTROLLED BY THE COMPANY AND IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER PO038964

Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

PO No: PO038964
PO Date: 2/7/18
Due Date: 2/8/18
Purchase Order Revision:
Revision Date:
Ship-To Contact: Lacelle, Linda
Phone: llacelle@dartaero.com

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	170234	D212-664-201	Aft Crosstube - High ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	2/8/18	1 pcs	0 pcs 1x	1 pcs AT 18/02/08	\$169.00/pcs	\$169.00
2	170233	D212-664-201	Aft Crosstube - High ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	2/8/18	1 pcs	0 pcs 1x	1 pcs AT 18/02/08	\$169.00/pcs	\$169.00
3	170232	D212-664-201	Aft Crosstube - High ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	2/8/18	1 pcs	0 pcs 1x	1 pcs AT 18/02/08	\$169.00/pcs	\$169.00
4	168063-A	D212-664-201	Aft Crosstube - High ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	2/8/18	1 pcs	0 pcs 1x	1 pcs AT 18/02/08	\$169.00/pcs	\$169.00
5	168063	D212-664-201	Aft Crosstube - High ***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.*** Issue P/O: _____ LIQUID PENETRANT INSPECTION AS PER QSI 038 OR LPI AS PER ASTM 1417 LEVEL 2	Firmed	2/8/18	1 pcs	0 pcs 1x	1 pcs AT 18/02/08	\$169.00/pcs	\$169.00
Grand Total:										\$845.00

Order Notes

Order Notes

Procurement Quality Clauses

A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 2/8/18 10:22 AM dart.lacelle.linda



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

Container View (Active) - Master Unit Containers

Master Unit No	Container No	Part No	Part Name	From Container	Current Location	Quantity
001866	S053730	AN6-40A	3/8-24 Bolt X 3" Long	s019412	ST333	4
001866	S053729	AN6-41A	Bolt	fm137371-0	ST333	2
001866	S053728	D3428-1	Placard	S038568	ST034	1
001866	S016881	MS21042L6	Nut		ST303	6
001866	S053726	NAS1149D0663J	Washer	s024481	ST263	18

Note: Ad hoc query view of Part.dbo.Container where Container.Active = 1.

Plex 3/22/18 8:45 AM dart.quirion.sonia